

VIA ECFS

February 26, 2016

Marlene H. Dortch, Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
TW-A325
Washington D.C. 20554

Re: Access to Telecommunications Equipment and Services by Persons with Disabilities [CG Docket No. 12-32]; Petition for Rulemaking Filed by the Telecommunication Industry Association Regarding Hearing Aid Compatibility Volume Control Requirements [CG Docket No. 13-46]; Amendment of the Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets [WT Docket No. 07-250]; Comment Sought on 2010 Review of Hearing Aid Compatibility Regulations [WT Docket No. 10-254]

Dear Ms. Dortch:

Enclosed for filing in the above referenced Notice of Proposed Rulemaking are the comments of the Georgia Institute of Technology (Georgia Tech), Center for Advanced Communications Policy (CACP) and the Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC).

Should you have any questions concerning this filing, please do not hesitate to contact me via email at helena.mitchell@cacp.gatech.edu.

Respectfully submitted,



Helena Mitchell
Principal Investigator, Wireless RERC
Center for Advanced Communications Policy
Georgia Institute of Technology

Enclosure

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Access to Telecommunications Equipment)	CG Docket No. 12-32
and Services by Persons with Disabilities)	
)	
Petition for Rulemaking Filed by the)	CG Docket No. 13-46
Telecommunication Industry Association)	
Regarding Hearing Aid Compatibility)	
Volume Control Requirements)	
)	
Amendment of the Commission's Rules)	WT Docket No. 07-250
Governing Hearing Aid-Compatible Mobile)	
Handsets)	
)	
Comment Sought on 2010 Review of Hearing)	WT Docket No. 10-254
Aid Compatibility Regulations)	

COMMENTS OF
GEORGIA INSTITUTE OF TECHNOLOGY (GEORGIA TECH), CENTER FOR ADVANCED
COMMUNICATIONS POLICY (CACP)
AND THE REHABILITATION ENGINEERING RESEARCH CENTER FOR
WIRELESS TECHNOLOGIES (WIRELESS RERC)

Georgia Tech's Center for Advanced Communications Policy¹ (CACP) in collaboration with the Rehabilitation Engineering Research Center for Wireless Technologies² (Wireless RERC) hereby submits comments in the above-referenced Notice of Proposed Rulemaking released on October 30, 2015. CACP is recognized at the state and national level as a neutral authority that monitors and assesses technical developments, identifies future options, and provides insights into related legislative and regulatory issues. CACP evaluates technological

¹ Georgia Tech's Center for Advanced Communications Policy (CACP) is supported, in part, by the Department of Homeland Security's Science and Technology (S&T) Directorate under contract #HSHQDC-14-C-0004. The opinions contained herein are those of the grantee and do not necessarily reflect those of the U.S. Department of Homeland Security S&T Directorate.

² The Rehabilitation Engineering Research Center for Wireless Technologies (Wireless RERC) is funded by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90RE5007-01-00). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this filing do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.

trends that can impact issues as diverse as wearable technologies, communications and technology access by people with disabilities and emergency communications. CACP is the home of the Wireless RERC. The Wireless RERC mission is to research, evaluate and develop innovative wireless technologies and products that meet the needs, enhance independence, and improve the quality of life and community participation of people with disabilities. We believe it is essential that information and communications technologies (ICT) and services increase their levels of accessibility for people with disabilities; as access to technology can enhance inclusive, independent living. Since 2001 both CACP and the Wireless RERC have been actively involved with research and regulatory issues concerning accessible ICT. The comments respectfully submitted below are based on subject matter expertise developed over the past 14 years. Findings from our consumer surveys and focus groups, policy research, and development efforts inform the recommendations made herein.

Specifically, the comments below are, in large part, informed by analyses of data collected via the Wireless RERC's hearing aid compatibility (HAC) survey research. The 2014 HAC survey was designed to gather data from people who use hearing aids and cochlear implants on how well their hearing technology works with their wireless handsets. Answers to the survey questions have provided insight into the effectiveness of hearing aid compatibility requirements in the United States, as well as the need for any amendments to the rules.

Paragraph A.1.14-16: Incorporation of the 2012 ANSI Wireline Volume Control Standard

We contend that any technology change that increases access to landline telephones will improve access to 911 emergency services, as well as improve the reach of reverse 911 calls. People who use hearing technology should be confident that when they contact emergency services their hearing technology and phone will work together, providing clear communications. It is critical that the technologies not prevent them from providing details regarding their emergency or from receiving instructions from the 911 operator. With that said, the Wireless RERC recommends that the FCC incorporate the proposed Volume Control Standard.

Paragraph A.III.28: Application of Inductive Coupling and Volume Control Requirements to Wireline VoIP Telephones

Any technology requirements for wireline phones should apply to CPE VOIP phones as well. As per our assertions in former filings concerning HAC, phones are rapidly evolving and the Commission should attempt to create a large tent to encompass as many forms of telecommunications service delivery to ensure people with disabilities are able to access devices having enhanced phone features.³ As evidenced in the limited filings by consumers in FCC rulemakings, one can imply that consumers are not fully apprised of regulations concerning HAC. In some cases, they may not have the technical and/or regulatory knowledge or understanding as to why some devices and services are covered and others are not. The consumer may become frustrated and dissatisfied with the use of their VoIP telephone due to the expectation that it will work with their hearing technology the way their landlines or wireless phones do. If it looks like a phone and functions like a phone, it should be covered under the rules and consumer experiences across the different phone technologies should be consistent. In the meantime, perhaps the Commission should increase its outreach to consumers and manufacturers about the HAC standards either through periodic News Releases, the FCC blog, social media or through web site alerts.

Paragraph IV.B.31-33, 35-37: Volume Control and Other Acoustic Coupling Issues for Wireless Handsets

Paragraph IV.B.31: The Wireless RERC agrees with the FCC's belief *"that standards and requirements for manufacturers and service providers are needed for volume control in wireless handsets as well."*⁴ Respondents to the Wireless RERC's 2014 HAC Survey indicated that volume control impacted the usability of their wireless handset. When asked, *"What, if any, assistive technology do you use to make your cell phone hearing aid compatible?"* 25% of respondents indicated they used technologies that enhance sound clarity and loudness:

³ Mitchell, H., Morris, J., LaForce, S., Bennett, D., Price, E., Lucia, F. (2015). Comments filed in response to *Public Notice Request for Updated Information and Comment on Wireless Hearing Aid Compatibility Regulations* [WT Docket Nos. 07-250 and 10-254]. Federal Communications Commission: Washington, DC, January 22, 2015.

⁴ 1996 HAC R&O, 11 FCC Rcd at 8282 ¶ 78.

amplifier (7.5%), Neckloop (17.7%). Regarding volume control specifically, 27% of respondents stated they were “dissatisfied” or “very dissatisfied” with the volume control on their wireless handset, while 23% rated it “about average.” Conversely, 50% of respondents indicated they were “very satisfied” or “satisfied” with the volume control of their wireless handset. All of these data, taken together, illustrates the need to consider whether there should be a volume control standard for wireless handsets, or whether the industry and the marketplace can arrive at workable solutions. For example, as stated in previous Wireless RERC comments (and further supported by Apple Inc.⁵), “wireless handset manufacturers [should] partner with hearing aid manufacturers to produce devices that are designed to work together.”⁶ As it stands now, the ratings shown above do not win repeat customers because they indicate consumer experiences with volume controls are polarizing.

Paragraph IV.B.32: We invite additional comment on the experiences that consumers with hearing loss are having when they attempt to locate wireless handsets with sufficient amplification capability to use with their hearing aids or cochlear implants. In general, we invite parties to update the record of these proceedings with respect to the need for volume control requirements for wireless handsets...

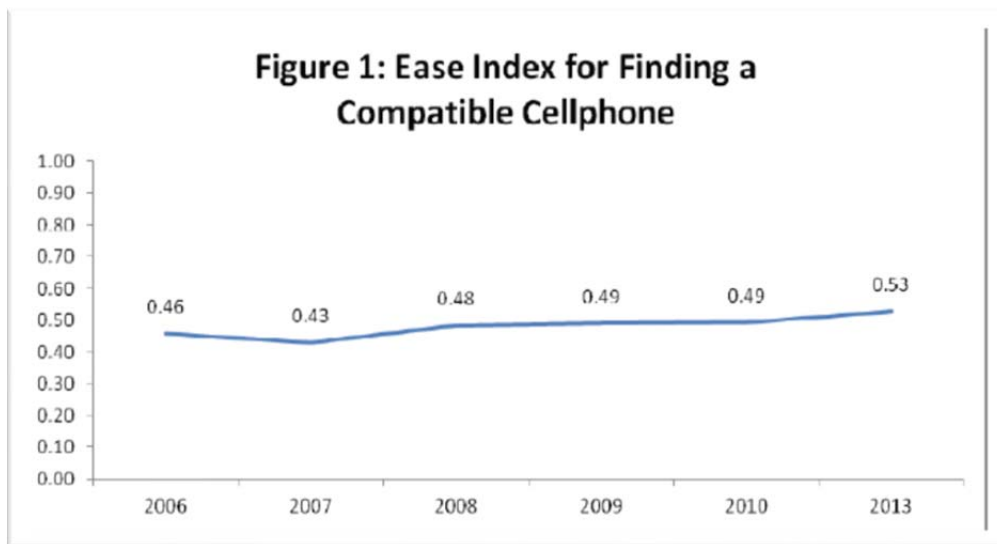
HAC survey respondents were asked to rate their experience, on a 5-point scale from very difficult to very easy, of identifying and purchasing a hearing aid-compatible wireless handset. From the results, Wireless RERC researchers produced a single “Ease Index” for each survey year (Table 1). As shown in Table 1 (and Figure 1), ease of finding a compatible wireless handset has only moderately improved from 2006 to 2013 (the latest year this question was asked).

⁵ Apple Inc. (2016). Comments filed *In the Matter of Improvements to Benchmarks and Related Requirements Governing Hearing Aid-Compatible Mobile Handsets* [WT Docket No. 15-285]; *Amendments to the Commission’s Rules Governing Hearing Aid-Compatible Mobile Handsets* [WT Docket No. 07-250]. Federal Communications Commission: Washington, DC, January 28, 2016.

⁶ Mitchell, H., Morris, J., LaForce, S., Bennett, D., Price, E., Lucia, F. (2015). Comments filed in response to *Public Notice Request for Updated Information and Comment on Wireless Hearing Aid Compatibility Regulations* [WT Docket Nos. 07-250 and 10-254]. Federal Communications Commission: Washington, DC, January 22, 2015.

Table 1 – Ease of finding a compatible cellphone by survey year 2006-2013

	2006	2007	2008	2009	2010	2013
Very Easy	1	3	9	17	12	39
Easy	15	5	50	42	41	70
About Average	30	17	103	91	75	126
Difficult	39	27	102	95	95	108
Very Difficult	30	25	85	78	61	99
Total Respondents	115	77	349	323	284	442
Total "Ease" Score	263	165	843	794	700	1168
Highest Possible Score (Total n x 5)	575	385	1745	1615	1420	2210
Ease Index	0.46	0.43	0.48	0.49	0.49	0.53



When asked "What, if anything, would you change about your cellphone to make it work better for you?" 29% of responses to this open-ended question addressed loudness/volume control.

A few of the comments [verbatim] are listed below:

- A better volume control
- A little louder; more distinct
- Ability to increase loudness during a conversation
- Adjust call volume control. I can adjust volume easily for the incoming-call ringer and incoming-text features, but not for two-way conversation on the phone.
- Adjust the volume and stop feedback.
- Amplify the sound like you can on land lines.

- *Better hearing aid [compatibility] and volume increase.*
- *Better sound quality and volume.*
- *Better t-coil interface which would give louder volume.*
- *Better volume and interface.*
- *Better volume control on speakerphone.*
- *Clarity is the biggest issue. Lack of clarity affects quality and volume.*
- *Clearer and louder volume.*
- *Greater volume.*
- *I need clarity!!! and volume controls.*
- *I would like it louder both the speaker on the phone or ear piece.*
- *I would like to hear the other speaker.*
- *Less distortion! More loud and clear!*
- *Louder & clearer so I didn't have to use a Bluetooth gateway around my neck. Use is difficult enough that I only use it when necessary, about 3-4 calls per year.*
- *Louder ring, stronger vibration, more cohesiveness with the Bluetooth (less breaking up in conversation).*
- *Louder sound when using the t-coil.*
- *Louder volume, ring tones and vibrations alerts.*
- *Make it louder, better clarity, less interference, easy to connect to via some form of wireless networking and easier to understand the conversations.*
- *Make the audio louder to hear phone calls, the ringer and text alerts.*
- *My whole family says that the volume is very low even though I have it as high as possible.*
- *Offer a volume boost for those of us who have severe hearing loss or access to captioning services.*
- *Stronger connection with t-coil. More volume.*
- *...Also the volume, allow greater range in volume control. Difficult to hear especially with background noise.*
- *The loudness and clarity - to be able to work with hearing aids*
- *Way to improve volume control - none available now*

Among other things, controlling the volume (or the inability to do so), continues to be an access issue for people with hearing loss. Based upon the consumer comments above and the data presented earlier in this document, the Wireless RERC supports further investigation of whether it is necessary to incorporate a volume control standard for wireless handsets, recognizing that this might take longer than voluntary compliance via industry driven solutions.

Paragraph IV.B.33: *"If a volume control requirement is adopted, should it apply to all wireless handsets or to a subset of total handset sales or models, as with the current hearing aid compatibility rule? Would such fragmented implementation approach cause confusion for consumers?"*

For consistency, if adopted, the volume control standard should apply to all wireless phones. However, physical volume controls should not be required if software-based settings are available. Fractional deployment causes problems for consumers in today's market as more and more consumers are opting to have wireless devices only. Statistics cited in the Commission's Seventeenth Annual Report of Competitive Market Conditions with Respect to Mobile Wireless, confirm that wireless only households (39%) are on the rise; households that have both landline and wireless phones (52%) are on the decline; and landline only households (< 10%) have steadily decreasing since 2008.⁷ According to a 2013 Wireless RERC survey, this trend holds for people with disabilities, with 32% reporting wireless only households. Also, as consumer's age they might need hearing aids they did not need when they purchased the equipment. These factors indicate the time is nigh to phase out the fractional deployment rules.

Paragraph IV.B.37: *"...labels for amplified telephones that are suitable for consumers with mild, moderate, and severe hearing loss, respectively. Would such labels be useful in the wireless context as well?"*

The Wireless RERC supports the incorporation of amplification labeling for wireless handsets. Research has shown that some consumers with hearing loss (39%) are accustomed to seeking out the M and T ratings on wireless phone packaging.⁸ Applying similar types of information and rules for amplification labeling seems a reasonable accompaniment to the

⁷ FCC (2014). *In the matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services* [WT Docket No. 13-135]. Washington, DC: 18 December. Available at <http://www.fcc.gov/document/17th-annual-competition-report>.

⁸ Morris, et al. (2014). Hearing Aid Compatibility of Cellphones: Results from a National Survey. *Journal on Technology and Persons with Disabilities*: Annual International Technology and Persons with Disabilities Conference. California State University, Northridge. ISSN 2330-4216

inclusion of a new volume control standard. However, we would strongly encourage outreach to people with hearing loss regarding the new amplification labels and the training of retail staff regarding the same.

In closing, the FCC's attention to ensuring HAC compliance is reflective of consumer expectations *and* the evolution of wireline and wireless technologies is commendable. Given the complexity of interactions between increasingly sophisticated and powerful wireless handsets, telecom delivery services (i.e. VoIP), hearing aids and the variability of hearing loss amongst the users, the difficulty of crafting regulations that improves access for end-users is not overlooked by the Wireless RERC/CACP. Nevertheless, people with hearing loss deserve and are entitled to parity of access to telecommunications services, wireless, or otherwise.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "H. Mitchell", is positioned above the typed name.

Helena Mitchell, PhD,
Salimah LaForce,
John Morris, PhD, and
Ed Price
Wireless RERC / Center for Advanced Communications Policy
Georgia Institute of Technology
500 10th Street, 3rd Fl. NW
Atlanta, GA 30332-0620
Phone: (404) 385-4640

Dated this 26th day of February 2016